

General

Guideline Title

Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis.

Bibliographic Source(s)

Ralston SL, Lieberthal AS, Meissner HC, Alverson BK, Baley JE, Gadomski AM, Johnson DW, Light MJ, Maraqa NF, Mendonca EA, Phelan KJ, Zorc JJ, Stanko-Lopp D, Brown MA, Nathanson I, Rosenblum E, Sayles S III, Hernandez-Cancio S, American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. *Pediatrics*. 2014 Nov;134(5):e1474-502. [242 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. *Pediatrics*. 2006 Oct;118(4):1774-93. [166 references].

All clinical practice guidelines from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the quality of the evidence (A-D, X) and the strength of the recommendation (strong recommendation, recommendation, option) are provided at the end of the "Major Recommendations" field.

Diagnosis

Key Action Statement 1a

Clinicians should diagnose bronchiolitis and assess disease severity on the basis of history and physical examination (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile Key Action Statement (KAS) 1a

- Aggregate evidence quality: B
- Benefits: Inexpensive, noninvasive, accurate

- Risk, harm, cost: Missing other diagnoses
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Key Action Statement 1b

Clinicians should assess risk factors for severe disease, such as age <12 weeks, a history of prematurity, underlying cardiopulmonary disease, or immunodeficiency, when making decisions about evaluation and management of children with bronchiolitis (Evidence quality: B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 1b

- Aggregate evidence quality: B
- Benefits: Improved ability to predict course of illness, appropriate disposition
- Risk, harm, cost: Possible unnecessary hospitalization parental anxiety
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: "Assess" is not defined
- Role of patient preferences: None
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None

Key Action Statement 1c

When clinicians diagnose bronchiolitis on the basis of history and physical examination, radiographic or laboratory studies should not be obtained routinely (Evidence quality: B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 1c

- Aggregate evidence quality: B
- Benefits: Decreased radiation exposure, noninvasive (less procedure-associated discomfort), decreased antibiotic use, cost savings, time saving
- Risk, harm, cost: Misdiagnosis, missed diagnosis of comorbid condition
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: Infants and children with unexpected worsening disease
- Strength: Moderate recommendation
- Differences of opinion: None

Treatment

Albuterol

Key Action Statement 2

Clinicians should not administer albuterol (or salbutamol) to infants and children with a diagnosis of bronchiolitis (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 2

- Aggregate evidence quality: B

- Benefits: Avoid adverse effects, avoid ongoing use of ineffective medication, lower costs
- Risk, harm, cost: Missing transient benefit of drug
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: Overall ineffectiveness outweighs possible transient benefit
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None
- Notes: This guideline no longer recommends a trial of albuterol, as was considered in the 2006 American Academy of Pediatrics (AAP) bronchiolitis guideline

Epinephrine

Key Action Statement 3

Clinicians should not administer epinephrine to infants and children with a diagnosis of bronchiolitis (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 3

- Aggregate evidence quality: B
- Benefits: Avoiding adverse effects, lower costs, avoiding ongoing use of ineffective medication
- Risk, harm, cost: Missing transient benefit of drug
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: The overall ineffectiveness outweighs possible transient benefit
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: Rescue treatment of rapidly deteriorating patients
- Strength: Strong recommendation
- Differences of opinion: None

Hypertonic Saline

Key Action Statement 4a

Nebulized hypertonic saline should not be administered to infants with a diagnosis of bronchiolitis in the emergency department (Evidence quality: B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 4a

- Aggregate evidence quality: B
- Benefits: Avoiding adverse effects, such as wheezing and excess secretions, cost
- Risk, harm, cost: None
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None

Key Action Statement 4b

Clinicians may administer nebulized hypertonic saline to infants and children hospitalized for bronchiolitis (Evidence quality: B; Recommendation Strength: Weak Recommendation [based on randomized controlled trials with inconsistent findings]).

Action Statement Profile KAS 4b

- Aggregate evidence quality: B
- Benefits: May shorten hospital stay if length of stay (LOS) is >72 hours
- Risk, harm, cost: Adverse effects such as wheezing and excess secretions; cost
- Benefit-harm assessment: Benefits outweigh harms for longer hospital stays
- Value judgments: Anticipating an individual child's LOS is difficult. Most US hospitals report an average LOS of <72 hours for patients with bronchiolitis. This weak recommendation applies only if the average LOS is >72 hours.
- Intentional vagueness: This weak recommendation is based on an average LOS and does not address the individual patient.
- Role of patient preferences: None
- Exclusions: None
- Strength: Weak recommendation
- Differences of opinion: None

Corticosteroids

Key Action Statement 5

Clinicians should not administer systemic corticosteroids to infants with a diagnosis of bronchiolitis in any setting (Evidence quality: A; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 5

- Aggregate evidence quality: A
- Benefits: No clinical benefit, avoiding adverse effects
- Risk, harm, cost: None
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Oxygen

Key Action Statement 6a

Clinicians may choose not to administer supplemental oxygen if the oxyhemoglobin saturation exceeds 90% in infants and children with a diagnosis of bronchiolitis (Evidence quality: D; Recommendation Strength: Weak Recommendation [based on low-level evidence and reasoning from first principles]).

Action Statement Profile KAS 6a

- Benefits: Decreased hospitalizations, decreased LOS
- Risk, harm, cost: Hypoxemia, physiologic stress, prolonged LOS, increased hospitalizations, increased LOS, cost
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: Oxyhemoglobin saturation >89% is adequate to oxygenate tissues; the risk of hypoxemia with oxyhemoglobin saturation >89% is minimal
- Intentional vagueness: None
- Role of patient preferences: Limited
- Exclusions: Children with acidosis or fever
- Strength: Weak recommendation (based on low-level evidence/reasoning from first principles)
- Differences of opinion: None

Key Action Statement 6b

Clinicians may choose not to use continuous pulse oximetry for infants and children with a diagnosis of bronchiolitis (Evidence quality: C; Recommendation Strength: Weak Recommendation [based on lower-level evidence]).

Action Statement Profile KAS 6b

- Aggregate evidence quality: C
- Benefits: Shorter LOS, decreased alarm fatigue, decreased cost
- Risk, harm, cost: Delayed detection of hypoxemia, delay in appropriate weaning of oxygen
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Limited
- Exclusions: None
- Strength: Weak recommendation (based on lower level of evidence)
- Differences of opinion: None

Chest Physiotherapy

Key Action Statement 7

Clinicians should not use chest physiotherapy for infants and children with a diagnosis of bronchiolitis (Evidence quality: B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 7

- Aggregate evidence quality: B
- Benefits: Decreased stress from therapy, reduced cost
- Risk, harm, cost: None
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None

Antibacterials

Key Action Statement 8

Clinicians should not administer antibacterial medications to infants and children with a diagnosis of bronchiolitis unless there is a concomitant bacterial infection, or a strong suspicion of one. (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 8

- Aggregate evidence quality: B
- Benefits: Fewer adverse effects, less resistance to antibacterial agents, lower cost
- Risk, harm, cost: None
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: Strong suspicion is not specifically defined and requires clinician judgment. An evaluation for the source of possible serious bacterial infection should be completed before antibiotic use.
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Nutrition and Hydration

Key Action Statement 9

Clinicians should administer nasogastric or intravenous fluids for infants with a diagnosis of bronchiolitis who cannot maintain hydration orally (Evidence quality: X; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 9

- Aggregate evidence quality: X
- Benefits: Maintaining hydration
- Risk, harm, cost: Risk of infection, risk of aspiration with nasogastric tube, discomfort, hyponatremia, intravenous infiltration, overhydration
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Shared decision as to which mode is used
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Prevention

Key Action Statement 10a

Clinicians should not administer palivizumab to otherwise healthy infants with a gestational age of 29 weeks, 0 days or greater (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 10a

- Aggregate evidence quality: B
- Benefits: Reduced pain of injections, reduced use of a medication that has shown minimal benefit, reduced adverse effects, reduced visits to health care provider with less exposure to illness
- Risk, harm, cost: Minimal increase in risk of respiratory syncytial virus (RSV) hospitalization
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Parents may choose to not accept palivizumab
- Exclusions: Infants with chronic lung disease (CLD) of prematurity and hemodynamically significant cardiac disease (as described in KAS 10b)
- Strength: Strong recommendation
- Differences of opinion: None
- Notes: This KAS is harmonized with the AAP policy statement on palivizumab

Key Action Statement 10b

Clinicians should administer palivizumab during the first year of life to infants with hemodynamically significant heart disease or CLD of prematurity defined as preterm infants <32 weeks, 0 days' gestation who require >21% oxygen for at least the first 28 days of life (Evidence quality: B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 10b

- Aggregate evidence quality: B
- Benefits: Reduced risk of RSV hospitalization
- Risk, harm, cost: Injection pain; increased risk of illness from increased visits to clinician office or clinic; cost; side effects from palivizumab
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Parents may choose to not accept palivizumab
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None
- Notes: This KAS is harmonized with the AAP policy statement on palivizumab

Key Action Statement 10c

Clinicians should administer a maximum 5 monthly doses (15 mg/kg/dose) of palivizumab during the RSV season to infants who qualify for palivizumab in the first year of life (Evidence quality: B, Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 10c

- Aggregate evidence quality: B
- Benefits: Reduced risk of hospitalization; reduced admission to intensive care unit (ICU)
- Risk, harm, cost: Injection pain; increased risk of illness from increased visits to clinician office or clinic; cost; adverse effects of palivizumab
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: Fewer doses should be used if the bronchiolitis season ends before the completion of 5 doses; if the child is hospitalized with a breakthrough RSV, monthly prophylaxis should be discontinued
- Strength: Moderate recommendation
- Differences of opinion: None
- Notes: This KAS is harmonized with the AAP policy statement on palivizumab

Hand Hygiene

Key Action Statement 11a

All people should disinfect hands before and after direct contact with patients, after contact with inanimate objects in the direct vicinity of the patient, and after removing gloves (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 11a

- Aggregate evidence quality: B
- Benefits: Decreased transmission of disease
- Risk, harm, cost: Possible hand irritation
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Key Action Statement 11b

All people should use alcohol-based rubs for hand decontamination when caring for children with bronchiolitis. When alcohol-based rubs are not available, individuals should wash their hands with soap and water (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 11b

- Aggregate evidence quality: B
- Benefits: Less hand irritation
- Risk, harm, cost: If there is visible dirt on the hands, hand washing is necessary; alcohol-based rubs are not effective for *Clostridium difficile*, present a fire hazard, and have a slight increased cost
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: None
- Exclusions: None
- Strength: Strong recommendation
- Differences of opinion: None

Tobacco Smoke

Key Action Statement 12a

Clinicians should inquire about the exposure of the infant or child to tobacco smoke when assessing infants and children for bronchiolitis (Evidence quality: C; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 12a

- Aggregate evidence quality: C
- Benefits: Can identify infants and children at risk whose family may benefit from counseling, predicting risk of severe disease
- Risk, harm, cost: Time to inquire
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Parent may choose to deny tobacco use even though they are, in fact, users
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None

Key Action Statement 12b

Clinicians should counsel caregivers about exposing the infant or child to environmental tobacco smoke and smoking cessation when assessing a child for bronchiolitis (Evidence quality: B; Recommendation Strength: Strong Recommendation).

Action Statement Profile KAS 12b

- Aggregate evidence quality: B
- Benefits: Reinforces the detrimental effects of smoking, potential to decrease smoking
- Risk, harm, cost: Time to counsel
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Parents may choose to ignore counseling
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None
- Notes: Counseling for tobacco smoke prevention should begin in the prenatal period and continue in family-centered care and at all well-infant visits

Breastfeeding

Key Action Statement 13

Clinicians should encourage exclusive breastfeeding for at least 6 months to decrease the morbidity of respiratory infections (Evidence quality: Grade B; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 13

- Aggregate evidence quality: B
- Benefits: May reduce the risk of bronchiolitis and other illnesses; multiple benefits of breastfeeding unrelated to bronchiolitis
- Risk, harm, cost: None
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: None
- Role of patient preferences: Parents may choose to feed formula rather than breastfeed
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None
- Notes: Education on breastfeeding should begin in the prenatal period

Family Education

Key Action Statement 14

Clinicians and nurses should educate personnel and family members on evidence-based diagnosis, treatment, and prevention in bronchiolitis (Evidence quality: C; observational studies; Recommendation Strength: Moderate Recommendation).

Action Statement Profile KAS 14

- Aggregate evidence quality: C
- Benefits: Decreased transmission of disease, benefits of breastfeeding, promotion of judicious use of antibiotics, risks of infant lung damage attributable to tobacco smoke
- Risk, harm, cost: Time to educate properly
- Benefit-harm assessment: Benefits outweigh harms
- Value judgments: None
- Intentional vagueness: Personnel is not specifically defined but should include all people who enter a patient's room
- Role of patient preferences: None
- Exclusions: None
- Strength: Moderate recommendation
- Differences of opinion: None

Definitions

Evidence Quality

Aggregate Evidence Quality	Benefit or Harm Predominates	Benefit and Harm Balanced
Level A Intervention: Well-designed and conducted trials, meta-analyses on applicable population Diagnosis: Independent gold standard studies of applicable populations	Strong recommendation	Weak Recommendation (based on balance of benefit and harm)
Level B Trials or diagnostic studies with minor limitations; consistent findings from multiple observational studies	Strong recommendation/Moderate recommendation	
Level C Single or few observational studies or multiple studies with inconsistent findings or major limitations	Moderate recommendation/Weak recommendation (based on low quality evidence)	
Level D Expert opinion, case reports, reasoning from first principles	Weak recommendation (based on low quality evidence)	No recommendation may be made
Level X Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit or harm	Strong recommendation/Moderate recommendation	

Definitions for Evidence-based Statements

Statement	Definition	Implication
Strong recommendation	A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and quality of evidence is excellent or unobtainable.	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present.
Moderate recommendation	A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and the quality of evidence is good but not excellent (or is unobtainable).	Clinicians would be prudent to follow a moderate recommendation but should remain alert to new information and sensitive to patient preferences.
Weak recommendation (based on low-quality)	A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), but the quality of evidence is weak.	Clinicians would be prudent to follow a weak recommendation but should remain alert to new information and very sensitive to patient

evidence) Statement	Definition	preferences. Implication
Weak recommendation (based on balance of benefits and harms)	Weak recommendation is provided when the aggregate database shows evidence of both benefit and harm that appear similar in magnitude for any available courses of action.	Clinicians should consider the options in their decision making, but patient preference may have a substantial role.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Bronchiolitis

Note: This guideline does not address long-term sequelae of bronchiolitis, such as recurrent wheezing or risk of asthma.

Guideline Category

Diagnosis

Management

Prevention

Treatment

Clinical Specialty

Emergency Medicine

Family Practice

Infectious Diseases

Pediatrics

Pulmonary Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To provide an evidence-based approach to the diagnosis, management, and prevention of bronchiolitis in children from 1 month through 23 months of age

Target Population

Children from 1 month through 23 months of age

Note: The guideline does not apply to children with immunodeficiencies, including those with human immunodeficiency virus (HIV) infection or recipients of solid organ or hematopoietic stem cell transplants. Children with underlying respiratory illnesses, such as recurrent wheezing, chronic neonatal lung disease (CLD; also known as bronchopulmonary dysplasia), neuromuscular disease, or cystic fibrosis and those with hemodynamically significant congenital heart disease are excluded from the sections on management unless otherwise noted but are included in the discussion of prevention.

Interventions and Practices Considered

Diagnosis

1. Diagnosis and assessment of severity based on history and physical examination
2. Assessment of risk factors

Treatment

1. Nebulized hypertonic saline as indicated
2. Nasogastric or intravenous fluids for infants
3. Consideration of the option to not use supplemental oxygen or continuous pulse oximetry
4. Antibacterial medications if indicated

Prevention

1. Palivizumab as indicated
2. Hand hygiene
3. Inquiry on possible exposure to tobacco smoke
4. Exclusive breast feeding for 6 months
5. Family education

Note: The following interventions were considered but not recommended:

- Routine radiographic or laboratory studies
- Albuterol or salbutamol
- Epinephrine
- Systemic corticosteroids

Major Outcomes Considered

- Efficacy and effectiveness of diagnostic tools
- Symptom improvement
- Mortality and morbidity
- Hospitalization rate
- Length of hospitalization
- Incidence of respiratory syncytial virus (RSV) infection
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The evidence search and review included electronic database searches in *The Cochrane Library*, Medline via Ovid, and CINAHL via EBSCO. The search strategy is shown in the Appendix in the original guideline document. Related article searches were conducted in PubMed. The bibliographies of articles identified by database searches were also reviewed by 1 of 4 members of the committee, and references identified in this manner were added to the review. Articles included in the 2003 evidence report on bronchiolitis in preparation of the American Academy of Pediatrics (AAP) 2006 guideline also were reviewed. In addition, the committee reviewed articles published after completion of the systematic review for these updated guidelines. The current literature review encompasses the period from 2004 through May 2014.

Other criteria helped define the setting, age, language, and date of publication. Both outpatient (clinicians' offices, outpatient clinics, emergency departments) and inpatient (hospitals) were included. Studies were limited to pediatrics. Searches were also limited to English language, although studies in other languages were reviewed when included in relevant systematic reviews. Date parameters were not restricted; however, newer studies were focused for antimicrobial therapy and cost effectiveness studies. In addition to the electronic searches, articles were received from subcommittee members, and reference lists were also searched. The same criteria were applied to these articles as to those in the initial search.

Study design criteria for full text review varied by section of the technical report. Meta-analyses and systematic reviews were reviewed for original studies not found in the initial electronic searches. For diagnostic studies, controlled clinical trials and observational studies (both prospective and large retrospective) studies were reviewed. For therapy studies, randomized controlled trials were reviewed as well as large prospective and retrospective observational studies. For prevention and long term effect studies, prospective observational and other epidemiologic studies were reviewed.

Number of Source Documents

From the initial electronic search, 2,887 articles were found related to infants and children diagnosed with bronchiolitis and its management. After removing duplicate citations and title and abstract review for relevance, patient population, and study design, full text review of 418 articles also included appraisal of validity. Committee members submitted an additional 46 articles. Seventeen articles were found through searching reference lists. Of these articles, 146 articles met inclusion criteria and were included in the technical report.

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Evidence Quality

Aggregate Evidence Quality	Benefit or Harm Predominates	Benefit and Harm Balanced
Level A Intervention: Well-designed and conducted trials, meta-analyses on applicable population Diagnosis: Independent gold standard studies of applicable populations	Strong recommendation	Weak Recommendation (based on balance of benefit and harm)
Level B Trials or diagnostic studies with minor limitations; consistent findings from multiple observational studies	Strong recommendation/Moderate recommendation	

Level C Single or few observational studies or multiple studies with inconsistent findings or major limitations	Aggregate Evidence Quality Benefit or Harm Predominates Moderate recommendation/Weak recommendation (based on low quality evidence)	Benefit and Harm Balanced
Level D Expert opinion, case reports, reasoning from first principles	Weak recommendation (based on low quality evidence)	No recommendation may be made
Level X Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit or harm	Strong recommendation/Moderate recommendation	

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Study Selection and Evaluation

Titles and abstracts were reviewed by a methodologist for potential inclusion. Titles and abstracts not relevant to the clinical topic areas designated by the American Academy of Pediatrics (AAP) Bronchiolitis Management Guideline Committee were excluded. Full texts of articles related to the respective sections of the guideline were distributed to committee members for review. The methodologist also reviewed all full text articles for the technical report, critically appraising individual articles using the Let Evidence Guide Every New Decision (LEGEND) evidence evaluation system. Evidence quality appraisal for the body of evidence related to recommendation statements followed the AAP's levels for aggregate evidence quality, allowing for integration of evidence into the recommendation development process by committee members. Narrative evidence synthesis was conducted and data was extracted by the methodologist. Evidence tables were constructed to summarize the studies, when relevant.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Methods

In June 2013, the American Academy of Pediatrics (AAP) convened a new subcommittee to review and revise the 2006 bronchiolitis guideline. The subcommittee included primary care physicians, including general pediatricians, a family physician, and pediatric subspecialists, including hospitalists, pulmonologists, emergency physicians, a neonatologist, and pediatric infectious disease physicians. The subcommittee also included an epidemiologist trained in systematic reviews, a guideline methodologist/informatician, and a parent representative.

The evidence-based approach to guideline development requires that the evidence in support of a policy be identified, appraised, and summarized and that an explicit link between evidence and recommendations be defined. Evidence-based recommendations reflect the quality of evidence and the balance of benefit and harm that is anticipated when the recommendation is followed. The AAP policy statement "Classifying Recommendations for Clinical Practice" was followed in designating levels of recommendation (see the "Rating Scheme for the Strength of the Recommendations" field).

Rating Scheme for the Strength of the Recommendations

Definitions for Evidence-based Statements

Statement	Definition	Implication
Strong recommendation	A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and quality of evidence	Clinicians should follow a strong recommendation unless a clear and compelling rationale for an

Statement	Definition	Implication
Moderate recommendation	is excellent or unobtainable. A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), and the quality of evidence is good but not excellent (or is unobtainable).	alternative approach is present. Clinicians would be prudent to follow a moderate recommendation but should remain alert to new information and sensitive to patient preferences.
Weak recommendation (based on low-quality evidence)	A particular action is favored because anticipated benefits clearly exceed harms (or vice versa), but the quality of evidence is weak.	Clinicians would be prudent to follow a weak recommendation but should remain alert to new information and very sensitive to patient preferences.
Weak recommendation (based on balance of benefits and harms)	Weak recommendation is provided when the aggregate database shows evidence of both benefit and harm that appear similar in magnitude for any available courses of action.	Clinicians should consider the options in their decision making, but patient preference may have a substantial role.

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

A draft version of this clinical practice guideline underwent extensive peer review by committees, councils, and sections within American Academy of Pediatrics (AAP); the American Thoracic Society, American College of Chest Physicians, American Academy of Family Physicians, and American College of Emergency Physicians; other outside organizations; and other individuals identified by the subcommittee as experts in the field. The resulting comments were reviewed by the subcommittee and, when appropriate, incorporated into the guideline.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

See the "Major Recommendations" field for benefits of specific interventions considered in the guideline.

Potential Harms

- Adverse effects from nebulized hypertonic saline, such as wheezing and excess secretions
- The risk of hypoxemia must be weighed against the risk of hospitalization when making any decisions about site of care. One study of hospitalized children with bronchiolitis, for example, noted a 10% adverse error or near-miss rate for harm-causing interventions.
- Side effects from palivizumab
- See the "Major Recommendations" field for more information on possible harms of specific interventions.

Qualifying Statements

Qualifying Statements

- This clinical practice guideline is not intended as a sole source of guidance in the management of children with bronchiolitis. Rather, it is intended to assist clinicians in decision-making. It is not intended to replace clinical judgment or establish a protocol for the care of all children with bronchiolitis. These recommendations may not provide the only appropriate approach to the management of children with bronchiolitis.
- The recommendations in this report do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Foreign Language Translations

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Ralston SL, Lieberthal AS, Meissner HC, Alverson BK, Baley JE, Gadomski AM, Johnson DW, Light MJ, Maraqa NF, Mendonca EA, Phelan KJ, Zorc JJ, Stanko-Lopp D, Brown MA, Nathanson I, Rosenblum E, Sayles S III, Hernandez-Cancio S, American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. *Pediatrics*. 2014 Nov;134(5):e1474-502.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2006 Oct (revised 2014 Nov)

Guideline Developer(s)

American Academy of Pediatrics - Medical Specialty Society

Source(s) of Funding

The American Academy of Pediatrics (AAP) has neither solicited nor accepted any commercial involvement in the development of the content of this publication. All funding was provided by the AAP, with travel assistance from the American Academy of Family Physicians, the American College of Chest Physicians, the American Thoracic Society, and the American College of Emergency Physicians for their liaisons.

Guideline Committee

Subcommittee on Bronchiolitis (Oversight by the Council on Quality Improvement and Patient Safety, 2103-2014)

Composition of Group That Authored the Guideline

Committee Members: Shawn L. Ralston, MD, FAAP (*Chair*); Allan S. Lieberthal, MD, FAAP (*Chair*); H. Cody Meissner, MD, FAAP; Brian K. Alverson, MD, FAAP; Jill E. Baley, MD, FAAP; Anne M. Gadomski, MD, MPH, FAAP; David W. Johnson, MD, FAAP; Michael J. Light, MD, FAAP; Nizar F. Maraqa, MD, FAAP; Eneida A. Mendonca, MD, PhD, FAAP, FACMI; Kieran J. Phelan, MD, MSc; Joseph J. Zorc, MD, MSCE, FAAP; Danette Stanko-Lopp, MA, MPH; Mark A. Brown, MD; Ian Nathanson, MD, FAAP; Elizabeth Rosenblum, MD; Stephen Sayles, III, MD, FACEP; Sinsi Hernández-Cancio, JD

Staff: Caryn Davidson, MA; Linda Walsh, MAB

Financial Disclosures/Conflicts of Interest

All authors have filed conflict of interest statements with the American Academy of Pediatrics (AAP). Any conflicts have been resolved through a process approved by the Board of Directors.

- Shawn L. Ralston, MD, FAAP: no financial conflicts; published research related to bronchiolitis
- Allan S. Lieberthal, MD, FAAP: no conflicts
- Brian K. Alverson, MD, FAAP: no conflicts
- Jill E. Baley, MD, FAAP: no conflicts
- Anne M. Gadomski, MD, MPH, FAAP: no financial conflicts; published research related to bronchiolitis including Cochrane review of bronchodilators
- David W. Johnson, MD, FAAP: no financial conflicts; published research related to bronchiolitis
- Michael J. Light, MD, FAAP: no conflicts
- Nizar F. Maraqa, MD, FAAP: no conflicts
- H. Cody Meissner, MD, FAAP: no conflicts
- Eneida A. Mendonca, MD, PhD, FAAP, FACMI: no conflicts
- Kieran J. Phelan, MD, MSc: no conflicts

- Joseph J. Zorc, MD, MSCE, FAAP: no financial conflicts; published research related to bronchiolitis
- Danette Stanko-Lopp, MA, MPH: no conflicts
- Mark A. Brown, MD: no conflicts
- Ian Nathanson, MD, FAAP: no conflicts
- Elizabeth Rosenblum, MD: no conflicts
- Stephen Sayles, III, MD, FACEP: no conflicts
- Sinsi Hernández-Cancio, JD: no conflicts

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. *Pediatrics*. 2006 Oct;118(4):1774-93. [166 references].

All clinical practice guidelines from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the [American Academy of Pediatrics \(AAP\) Policy Web site](#) .

Availability of Companion Documents

None available

Patient Resources

A variety of patient resources on bronchiolitis are available in English and Spanish from the [American Academy of Pediatrics Healthy Children Web site](#) .

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NGC Status

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